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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,120	09/30/2003	Tomomi Yoshizawa	KOY-0013	4966
23413	7590	06/10/2005	EXAMINER	
CANTOR COLBURN, LLP			VO, ANH T N	
55 GRIFFIN ROAD SOUTH			ART UNIT	
BLOOMFIELD, CT 06002			PAPER NUMBER	
			2861	

DATE MAILED: 06/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/675,120

Applicant(s)

YOSHIZAWA ET AL.

Examiner

Anh T.N. Vo

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

***CLAIM REJECTIONS***

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

.A person shall be entitled to a patent unless --

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim 17 is rejected under 35 USC 102 (e) as being anticipated by Yoshizawa et al. (US Pat. 6,733,113).

Yoshizawa et al. disclose in Figures 1-2 an ink jet recording apparatus comprising a driving frequency of the ink jet recording head is 15 kHz or above and/or 25 kHz or above and/or 35 kHz or above (column 9, lines 30-34).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior arts are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 USC 103 (a) as being unpatentable over Owatari (US Pat. 4,489,334) in view of Yoshizawa et al. (US Pat. 6,733,113) and Takeda et al. (US Pat. 5,944,917).

Owatari discloses in Figures 1-3 an ink jet supply for an ink jet head comprising:

- an ink cartridge (24);  
an ink jet recording head (20);
- an ink supply tube (21) which connects the ink cartridge (24) and the ink jet recording head (20), wherein a driving frequency of the ink jet recording head is 2kHz (column 4, lines 13-17);
- wherein the dissolved oxygen concentration is 5.3 ppm. (Column 4, lines 5-7);
- a contact angle of the ink to the inner surface of the ink supply tube is below 90 degree (Figures 1-2).

However, Owatari does not disclose a driving frequency of the ink jet recording head is 15 kHz or above and/or 25 kHz or above and/or 35 kHz or above and an average surface roughness of an inner surface of the liquid supply tube is 200 to 2,000 nm.

Nevertheless, Yoshizawa et al. disclose in Figures 1-2 an ink jet recording apparatus comprising a driving frequency of the ink jet recording head is 15 kHz or above and/or 25 kHz or above and/or 35 kHz or above (column 9, lines 30-34).

Furthemore, Takeda et al. discloses a stainless steel pipe comprising an average surface roughness of an inner surface of the liquid supply tube is 200 to 2,000 nm and/or 400 to 1000 nm (column 2, lines 5-8).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the teaching of Yoshizawa et al. and Takeda into the Owatari device for the purpose of improving the recording speed and reducing particle emission from an liquid supply pipe as well as an excellent corrosion resistance.

Claims 2-16 and 18-32 are are rejected under 35 USC 103 (a) as being unpatentable over Owatari (US Pat. 4,489,334) in view of Yoshizawa et al. (US Pat. 6,733,113) and Takeda et al.

(US Pat. 5,944,917) as applied to claims 1 and 17 and further in view of Goto et al. (US Pat. 6,729,718), Konishi et al. (JP Pat. 02002256187A) and Konica (JP2004202706A).

Owatari in view of Yoshizawa et al. and Takeda et al. disclose the basic features of the claimed invention were stated above but do not disclose the ink contains a colorant, water and a water-soluble organic solvent, the ink having a viscosity of 3.0 to 8.0 mPa.s; wherein the ink contains a colorant, water and a water-soluble organic solvent, the ink having a surface tension of 20 to 35 mN/m; the colorant ink is a pigment; wherein the ink contains 5 to 60 wt % of triethylene glycol monobutyl ether, 1,2-hexanediol, 1,2-pentanediol or t-butanol; wherein the ink contains an acetylene glycol-base nonionic surfactant; the ink having a foaming power of 100 mm or below; and a total content of calcium ion, magnesium ion and iron ion in the ink is 10 ppm or below.

Goto et al. disclose ink using in a recording apparatus comprising:

- the ink contains a colorant, water and a water-soluble organic solvent, the ink having a viscosity of 3.0 to 8.0 mPa.s (column 26, line 8);
- wherein the ink contains a colorant, water and a water-soluble organic solvent, the ink having a surface tension of 20 to 35 mN/m (column 28, lines 1-7);
- the colorant ink is a pigment (column 34, lines 21-22);
- wherein the ink contains 5 to 60 wt % of triethylene glycol monobutyl ether, 1,2-hexanediol, 1,2-pentanediol or t-butanol (column 25, lines 31-49); and
- wherein the ink contains an acetylene glycol-base nonionic surfactant (column 32, lines 22-32).

Konishi et al. discloses an ink for an ink jet recording device comprising the ink having a foaming power of 100 mm or below (foaming power is 50mm, see Solution).

Oki et al discloses an aqueous ink comprising a total content of calcium ion, magnesium ion and iron ion in the ink is 10 ppm or below (column 19, lines 8-14).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the teaching of Goto et al., Konishi et al. and Oki et al into the Owatari ink jet fluid supply, as modified, for the purpose of providing an ink jet recording head having good discharge stability and recording image quality.

It is noted that the recitation "a contact angle of the ink to the inner surface of the ink supply tube is 10 degree to 60.degree. or below and the ink having a dissolved oxygen concentration of 2 ppm or below and/or 0.01 to 1 ppm or below and/or 4 ppm or below" appears to be as a design expedient for an engineer depending upon particular environment and applications in which the Owatari ink jet fluid supply is to be used. Also, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable range involves only routine skill in the art. *In re Aller*, 105 USPQ 233

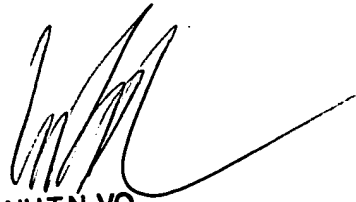
#### ***Citation of Pertinent Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These prior art references (US Pat. 4,609,925, US Pat. 6,572,227) cited in the PTO 892 form show an ink supply system which is deemed to be relevant to the present invention. These references should be reviewed.

#### ***CONCLUSION***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Anh Vo. whose telephone number is (571) 272-2262.

The fax number of this Group 2800 is (703) 872-9306.

  
ANH T.N. VO  
PRIMARY EXAMINER  
June 2, 2005